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POLITE ARTS.

The Thanks of the Society were this Session voted to Mr. TIMOTHY SHELDRAKE, of the Strand, London, for the following Communication on the Nature and Preparation of DRYING OILS for painting Pictures; being an Addition to his former Remarks, published in the Sixteenth and Seventeenth Volumes of their Transactions.

SIR,

IN the year 1797 I communicated to the Society, some papers on the preparation of vehicles for painting; the intention of which was to point out such as gave brilliancy and duration to colours, and were probably similar to, if not actually the same as, those which  
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were used by those artists who were most celebrated for their skill in the art of colouring. As the facts contained in those papers were likely to be useful to such as practised the art of painting, and as I declared that I had no expectations of premium or compensation for this communication, the Society voted me their greater Silver Pallet; and it has been resolved to publish the papers in the order in which they were received from me.

In N<sup>o</sup> I. I merely stated the fact, that colours mixed with solutions of amber or copal were more brilliant and durable than the same colours when mixed with drying oils; and I offered to make farther communications to the Society on this subject, if required.

Having been requested to do so, I communicated the following (N<sup>o</sup> II.) memorandums, On the nature and preparation of Drying Oils, composed with  
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a view to the improvement of such as are used by artists, as vehicles for painting.

The above-mentioned paper was shown to some artists, who gave it as their opinion that the vehicle proposed was not new, and it was thought impossible to paint with it. To this I replied, that I knew it was not new, and believed it to be the vehicle used by many of the older painters, particularly such as were most celebrated for their skill in colouring: and I digested the fruits of my researches on this part of the subject in the paper N<sup>o</sup> III. entitled, “ Conjectures tending to show that the Vehicle described is similar in principle, if not identically the same, as that used by several of the old Painters,” &c.

In this paper it is mentioned, that a part of the peculiar effect of the Venetian pictures is occasioned by the method or process used in painting them; and being asked my opinion on this part  
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of the subject, I communicated the paper N<sup>o</sup> IV. which has been printed in the Sixteenth Volume of the Society's Transactions, page 279, with the title of "Dissertation on Painting in Oil, in a manner similar to that practised in the ancient Venetian School;" and another paper, N<sup>o</sup> V. containing "An Account of my Method of purifying the Oils, dissolving the Resins, and compounding them together, so as to form Vehicles for Painting or Varnishes." This paper has been published in the Seventeenth Volume of the Society's Transactions, page 283.

It is evident these papers were written singly at the time they were communicated; and though each of them may be thought satisfactory, with respect to the particular subjects of which it treats, yet as a whole they are defective; and are in that respect undoubtedly different from what they would have been, had I arranged my materials so as to form one  
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dissertation on the subject. As it is believed that they may convey useful hints to those who are engaged in the Art of Painting, it has been thought advisable to restore them to that connected form in which they were communicated by me, and to thus print them in the Society's Transactions, merely referring in their proper places to those parts which have already appeared in the former volumes.

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N<sup>o</sup> II. *On the Nature and Preparation of Drying Oils; with a View to the Improvement of such as are used by Artists, as Vehicles for Painting.*

Expressed Oils, considered with a view to the painter's use of them, may be divided into two kinds; first, such as are capable of drying in some circumstances by themselves, and always with certain additions; and secondly, such as

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cannot be made to dry by any means whatever.

Of the first, which I shall call Drying Oils, there are three in common use, viz. linseed, nut, and poppy oil. The first is darkest coloured, and dries the soonest; the second is lighter, but does not dry so soon; and the third has least colour, and dries slower than either of the others.

By a process, which it is perhaps needless to describe here (*see Vol. xvii. page 281*), I have succeeded in separating from each of those oils, a mucilage or gum, in a liquid state, and capable of mixing with water in every proportion, though, when thoroughly dry, it would not dissolve in cold water; but my experiments on this head were not carried to any great length. It is to be remarked that linseed oil afforded most of this gum, nut oil the next largest quantity, and poppy oil the least of all.

Olive



Olive oil, when treated in the same manner, afforded none of this mucilaginous substance ; whence I was led to conclude that the essential difference between the drying Oils, and those which do not dry, consists in this:—that the latter either contains no mucilage or gum, or that it is so intimately combined with its other principles, that it cannot be separated from them in that peculiar manner which always takes place in Oils which dry by themselves, or when mixed with colours.

If drying Oil is exposed to the air, in a shallow vessel, and left at rest, a pellicle is soon formed on the top, and becomes externally perfectly dry. If this be removed, as econd will be formed in the same manner ; and if this experiment be repeated many times on the same quantity of oil, without moving or shaking the vessel, it will be found that the second pellicle will require more time to form it than the first, and so on, till

it will be found difficult to get it fairly skinned over in a considerable time. The same effect takes place, in a less visible manner, in every quantity of drying Oil which is united with colours in a picture.

From this experiment it is to be concluded, that drying Oils exert that faculty by throwing up their mucilaginous parts, which become solid when at rest, and in contact with the air.

The ingredients added to Oils to make them dry faster, viz. calces of lead, saline substances, earths or gums, are such as unite with and increase the quantity of those parts which float to the top, and form a skin, more or less dark, over the colours originally mixed with them. If we consider the nature of these ingredients, we shall be at once enabled to account for a fact universally known, viz. that in proportion to the strength of the drying Oil used in painting a picture its colour becomes depraved. It will

will be injured and finally destroyed, by being kept in a damp situation, excluded from a free circulation of air, or placed under a glass.

The desideratum is to prepare Oil or other vehicle for painting, so that the colours, when mixed with it, shall not be debased under any of the above-mentioned circumstances. It must be so prepared or used, that it shall serve as a cement to unite and bind the colours, without skinning over them. It must likewise not contain those principles which always exist in the calces of lead, saline, or earthy substances, which from the first deprave the colours, and attract particles from the air, under peculiar circumstances, which increase that depravity, till at last the appearance of the colours is totally destroyed.

It is only among the resins or bitumens that we can expect to find a substance possessing the properties requisite to give to colours all the brilliancy

and durability of which they are susceptible. My first attempts and experiments were made with solutions of mastic and sandarac in the painters oils; but though these compositions possessed more brilliancy than the common drying oils, they were liable to a considerable objection; for they did not dry readily, and when dry, were easily acted upon by all the common solvents for resinous substances, and on that account must be very deficient in durability, which is one of the most necessary qualities I wished to discover.

The difficulty with which amber is in any way dissolved, suggested the propriety of trying that substance. Accordingly I dissolved it, in each of the painters oils, by Dr. Lewis's process, without injuring its colour; and this solution was made in the common way. It was much darker coloured in itself, but produced scarcely any difference in effect when mixed with colour. By experiments

periments with each of these solutions I ascertained the following facts, viz.

Every colour, and all the tints compounded from it, were more brilliant than corresponding tints and colours mixed with the best drying Oils to be procured from the shops.

Colours mixed with amber, after having been shut up in a drawer for several years, lost nothing of their original brilliancy. The same colours tempered with oils, and excluded from the air, were so much altered, that they could scarcely be recognized.

Colours tempered with amber were laid on plates of metal, and exposed (both in the air and close boxes) for a long time, to different degrees of heat, from that of the sun in summer to the strong heat of a stove, without being injured. It is needless to observe that oil colours cannot undergo the same trials without being destroyed.

These colours, when perfectly dried in any way, were not acted upon by spirit of wine and spirit of turpentine united. They were washed with spirit of sal armoniac, and solutions of pot-ash, for a longer time than would destroy common oil colours, without being injured.

They dry as well in damp as in dry weather, and without any skin upon the surface. They are not liable to crack, and are of a flinty hardness; whence it appears that this vehicle possesses every desirable property, and it is presumed may be a discovery of some importance to artists.

Having succeeded thus far with amber, I tried the same experiments upon solutions of gum copal, which is nearly as hard and insoluble as amber itself. The result of these was the same as the former, except that with copal the colours were something brighter than with amber. As it is extremely troublesome  
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to dissolve the copal and amber, I tried those solutions of them in oil which are sold in the shops. When good, I found them to answer as well as my own. This is a great convenience, as many might be deterred by the difficulty of preparing this vehicle, who may willingly use it, as it thus to be procured without that trouble.

*The Method of using the Solution of Amber or Copal, as a Vehicle for painting.*

The cloth or other substance to be painted on, should be prepared with some colour fully saturated with drying oil; or it will be better done with the same vehicle to be used in painting. If it is not fully saturated, it will absorb some of the vehicle from the colours, which is what is commonly termed the colours sinking in.

All the colours which require grinding, should be previously ground in spirit of turpentine. All the pure parts should be  
tempered

tempered with such a quantity of the vehicle as will enable them to lie on the pallet. The white should be tempered as stiff as possible. All the tints should be made by mixing the colours so prepared without any more of the vehicle, but they should be diluted with spirit of turpentine, if necessary for working.

If the ground is properly prepared, and the above caution observed in tempering the colours, it will be found that all the dark colours in the picture will bear their full tone, and have a demi-transparency, which increases their native brilliancy, without the dingy appearance so common in ordinary oil-painting. The admixture of white increases the body of the colours progressively, till there will be left in the lightest parts, only so much of the vehicle as will bind the colours, and give them their full tone, but with very little of a shining appearance. When the picture is perfectly dry, it should be varnished with a  
mastic



mastic or similar varnish. Perhaps the best would be copal varnish made by solution in spirit of turpentine, or spirit of wine.

The rationale of this vehicle seems to be this: the amber and copal, when dissolved in oil, form a homogeneous mass, which dries by inspissating, instead of skinning over, like the common drying oils, which consist of heterogeneous parts, some of which separate and dry on the top.

As the amber and copal are not soluble in any of the menstruums which dissolve most resinous substances, pictures painted with them cannot be injured, if cleaned with those menstruums: and as they are extremely hard, and the most durable substances of their class, they protect the colours from every kind of injury, more effectually than any other known vehicle.

Nº III. *Conjectures tending to show that the vehicle which I have described, is similar in principle, if not identically the same, as that used by several of the older Painters, who were eminent for their skill in Colouring.*

Lomazzo, an eminent painter, and pupil of Leonardo da Vinci, published a Treatise on Painting, in which it is mentioned that linseed or nut oil was generally used for painting: he likewise observes, that powdered glass was used as a dryer. As Lomazzo was blind when he published his treatise, he could have no motive for keeping any thing which he knew secret; whence it is to be concluded, that those oils were generally used for painting in his time, and that he knew of no exceptions to the practice.

In one part of L. da Vinci's Treatise on Painting, he mentions *nut-oil and amber*

*amber.* As we know that amber gives peculiar brilliancy to colours, that L. da Vinci was peculiarly celebrated for the richness of his colouring, and are informed from his own writings that he was acquainted with solution of amber in nut-oil, it is to be presumed *that* was the vehicle he used. If this supposition is not to be admitted, we must believe that he knew how to dissolve amber in nut-oil (a process at that time both tedious and troublesome), without knowing the best use to which he could possibly apply it.

Leonardo's biographer says, " When he was at Rome, Leo X. resolved to employ him. Leonardo hereupon sets himself to the distilling of oils, and the preparing of varnishes to cover his paintings withal: of which the Pope being informed, said, pertly enough, that he could expect nothing of a man who thought of finishing his works before he had begun them. Leonardo therefore

therefore left Rome without having been employed."

I must beg leave to dissent from his Holiness's opinion. If my idea of Leonardo's vehicle be just, it was natural for him to begin the preparation of it as soon as he knew that he was to be employed as a painter : and as the spirit of that time led every one who made any useful discovery, to preserve it as a valuable secret, it was equally natural for him to account for his employment by saying that he was preparing varnishes. Whatever his secrets were, they remained unknown to the world till 1651, when his Treatise on Painting was published.

The next intimation of solutions of amber which I have obtained is from the works of Boyle, who gained much of his information from Italian chemists ; whence it is evident that the knowledge of this preparation is of long standing in that country ; and its use, if it was  
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used at all in the arts, is to be sought for in the works of Italian artists.

Whoever examines the Venetian pictures with attention, considers that the best artists of that school were remarkable for the facility with which they worked, and reflects on some passages in Lomazzo, will be disposed to admit that the peculiar skill of the Venetian painters depended on three circumstances, viz. the colours they used, their method of using them, and the vehicle they worked with. Of the first, Lomazzo gives positive information: the second can never be known without information equally positive; but of the vehicle some knowledge may be obtained by way of analysis. Till that knowledge is obtained, I may perhaps be excused for hazarding the following conjectures.

If my experiments have not misled me, I am entitled to draw the following conclusions from them. Wherever a picture is found possessing evidently superior

perior brilliancy of colour independent of what is produced by the painter's skill in colouring, that brilliancy is derived from the admixture of some resinous substance in the vehicle. If it does not yield on the application of spirit of turpentine and spirit of wine separately or together, or to such alkalies as are known to dissolve oils in the same time, it is to be presumed that vehicle contains amber or copal, because they are the only substances known to resist those menstrua.

I have been told, and some experiments of my own prove the information to be true, that the Venetian pictures, considered with respect to vehicle, are of two kinds: for some are extremely hard, and not at all affected by any of the above menstrua; others are similar in colour, but so tender that it is scarcely possible to clean them without injury, and in that respect are little superior to mere turpentine colours. The first, in consequence

consequence of the data which I have laid down, incur the suspicion of being painted with amber or copal, but how are we to distinguish with which?

As each of these substances resists equally the common menstrua, perhaps the distinction can only be made by ascertaining the date of the picture. For example:—if it is found to have been painted before copal was known in commerce, it may safely be said to have amber for its basis; but if it has been painted after that period, I know of no method of distinguishing which of the two was made use of. As copal could not have been known, as an article of trade, before the seventeenth century, it follows that all pictures painted before that period, and possessing the properties I have described, must have amber for the basis of their vehicle. As this exception necessarily includes all the Venetian artists of the first class, we are therefore authorised to conclude that, if the works

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of these artists can bear the test of the menstrua I have mentioned, amber was the basis of the vehicle with which they were painted.

I once saw a recipe for dissolving copal, said to have been brought from Venice towards the close of the last century. The process was, to melt Venice turpentine upon the fire, to add gradually copal powdered, stirring them together to be united in fusion, and afterwards spirit of turpentine, in order to dilute it to the consistence of varnish. I tried this process, but it did not succeed.

Upon inquiry I found that the Venice turpentine of the shops was only common resin, dissolved in spirit of turpentine to a proper consistence; whence the cause of my failure was evident. Reflecting on the commercial pursuits of the Venetians in the fifteenth and sixteenth centuries, I was led to conjecture that the substance called originally Venice



nice turpentine was the product of some country intimately connected with them. Pursuing this idea, I procured, with much difficulty, some Chio turpentine, repeated my experiment, and succeeded completely. Besides the property of uniting easily with copal, it had others that excited my attention. Common resins, if exposed to fire, burn with extreme fierceness and rapidity; but when some of this was laid on the point of a knife, and held in the flame of a candle, it melted and dropped down before it began to burn. It emitted a peculiarly grateful smell; was of a most beautiful pale gold colour; was more brilliant than any turpentine I had ever seen; and when diluted to the consistence of varnish, perfectly resembled in colour, a solution of copal which I made in spirit of turpentine with camphor.

I showed some of this to a gentleman who was conversant in such subjects. He told me that, when at Venice, he fre-

quently rubbed pictures violently with his handkerchief, to try if he could discover what they were painted with ; and when so rubbed, they smelt exactly like what I then produced to him.

As I had previously perfected what I thought to be a superior vehicle, with which this could not vie in hardness and durability, I did not prosecute my experiments with this any farther ; but as it unites rapidly with copal, and possesses all its visible properties, I may be permitted to conjecture that it would have similar effects when mixed with colours : and if there was any second, inferior, and common vehicle, similar in its visible properties to the last, and so much within the reach of the most ordinary painters, as to give their works one common mark with those of the first artists, it would be difficult to point out a substance more likely to afford it than this which must have been common in their own country, since its name is still  
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attached to substances of the same class throughout Europe, though its real properties are now but little known.

If this was the basis of the common Venetian vehicle, it might have been used with or without oil. If the latter, the works of the common Venetian painters must have been mere varnish painting : if the former, it must have been compounded with the oil, according to the principles I have already explained. I am inclined towards the latter opinion, from having heard an observation attributed to Bombelli, a celebrated Venetian painter, who said, “ *That he wished his pictures to dry as fast as possible, that the oil in them might not rise to the surface, and turn yellow.*”

To this conjecture it may be objected that turpentine and compounds from them do not dry well. I am not prepared to answer this objection, as I have made no experiments relative to

it; but it certainly is not conclusive, as such compounds may not dry well in this country, though they may in the warm climate of Italy.

In the *Maniere d'imprimer les Tableaux*, published by Le Blond at Paris, 1740, is a recipe for the varnish he used on the coloured prints executed by him, in this country, before he went to France. It is as follows:—"Take four parts of balsam of capivi and one of copal. Powder and sift the copal; and throw it by degrees into the balsam of capivi, stirring it well each time it is put in: I say each time; for the powdered copal must be put in by degrees, day after day, in at least, fifteen different parts. The vessel must be close stopped, and exposed to the heat of the sun, or a similar degree of heat, during the whole time; and when the whole is reduced uniformly to the consistence of honey, add a quantity of warm turpentine; *Chio turpentine is the best.*"

Le Blond's

Le Blond's prints were long neglected, and are now forgotten. Whatever difference of opinion may prevail respecting them, there can be none respecting his varnish, as I have seen some of these prints in perfect condition, notwithstanding they had been thrown carelessly about for nearly sixty years.

Le Blond was a pupil of Carlo Maratti. He died at a very advanced age, leaving behind him the character of an ingenious projector. It is probable that he might collect much information analogous to his pursuits during a long life; but it is more probable that he obtained much of it where he received his education. Thus, wherever we find notices of the use of these substances in the Arts, they invariably lead us towards Italy, where they certainly were first known.

I have thus detailed the circumstances which impress me with a conviction that the vehicle I have offered to public notice

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is, in substance, the same as that used by the best colourists of the Italian schools. What impression the facts I have enumerated may make upon others I know not: but still the truth of my opinion must be determined by experience; for it would be of small consequence to prove that this vehicle was used in former times, unless it can likewise be made evident that it will be useful to the present race of Artists.

Yours, &c.

TIMOTHY SHELDRAKE.

*Strand,*  
*February, 1801.*

MR. CHARLES TAYLOR.